Forest Insect & Disease Management

Interim Report

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EVALUATING THE EFFECT OF RELEASE CUTTINGS ON WHITE PINE WEEVIL INFESTATION, THE BLACK RIVER STATE FOREST, WISCONSIN

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INTRODUCTION

The increasing interest by land managers for management of natural young white pine stands to control white pine weevil damage lead to the establishment of this project in 1972. Al Kubiske, Supervisor, Black River State Forest, and Frank Morse, Entomologist, Wisconsin Department of Natural Resources, provided the area and assistance in the initial field work and collection of the annual field data.

The area selected for the treatments contained a manageable naturally seeded white pine stand which has become established under a low value hardwood overstory

OBJECTIVE

The purpose of this project is to measure and evaluate, for management recommendations, the effect of hardwood overstory removal on white pine weevil infestation trend, and pine internode length/diameter growth changes.

METHOD

The levels of overstory retained after treatment are expressed as basal area. These levels are:

1. 0 basal area
2. 30 sq ft B.A.
3. 50 sq ft B.A.
4. 70 sq ft B.A.
5. No overstory removed--check

Treatments were accomplished by girdling hardwood trees in each block to the above B.A. levels. Each treatment was completed on two blocks, 5 to 7-1/2 acres each, during the winter 1973-74. Within each block ten permanent 1/50 acre plots were established for weevil infestation and tree growth data.

At the end of the growing season, 1975, sample trees, between 4 and 12 feet, were selected and numbered at each sample plot. Each tree was measured for total height, length and diameter of internode growth from 1971 through 1975. Incidence of weevil damage was also recorded. Within each plot the number of trees over 12 feet was recorded and old or current weevil damage recorded.

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INTERIM RESULTS

A preliminary evaluation of the treatment effects on weevil incidence and internode growth has been made for this interim report.

1. Weevil infestation--none of the sample trees have current or old weevil damage. Weevil damage in 1975 on trees over 12 feet is less than 2% for all treatment blocks combined. These trees are dominant in the pine crown level but codominant in the hardwood canopy.

2. Tree growth response--the increase in leader length in 1975 in the 0 and 30 sq ft B.A. treatments is over 100 percent greater than the growth shown in the check treatment. The rate of leader growth in the 50 and 70 sq ft B.A. treatments is less than half that of the two other treatments and one-third or less greater than in the check treatment.

The leader diameter response shows the same pattern of increased rate of growth as with the length growth (Table 1).

Treatment	Leader (inches) Length 1975	Leader (inches) Diameter 1975	Percent Increase Growth Length 1975/ck	Percent Increase Growth Diameter 1975/ck
Check	5.9	0.11	-	-
to 70 sq ft BA	6.7	0.13	13.0	22.0
to 50 sq ft BA	7.9	0.14	33.0	33.0
to 30 sq ft BA	12.5	0.17	112.0	55.0
to 0 sq ft BA	13.7	0.20	132.0	90.0

Data for the length and diameter of internodes 1971 through 1975 are given by treatment in Table 2.

DISCUSSION

The increase in internode length and diameter was expected. As only two growing seasons have past since completion of the treatments, final conclusions cannot be drawn. The decrease in leader length, for all treatments in 1974 is probably due to the drought conditions that year (Table 3).

The white pine weevil has a district requirement in leader characters for egg laying. Research has shown that leader diameters less than 0.3 inch are not selected for ovipositon.[1/] The data of leader diameters show that only the complete removal treatment is approaching (on an average) this diameter requirement.

[1/] Sullivan, C.R., 1961 - The effect of weather and physical attributes of white pine leaders on the behavior and survival of the white pine weevil, Pissodes strobi (Peck), in mixed stands. Can. Ent. 93 (9):721-41. 1961.

Table 2. Average Internode Length (L) and Diameter (D) in Inches For All For Sample Trees in Each Treatment. Data Taken in Fall 1975.

Treatment Overstory Removed To	Total No. Sample Trees	Internode (Years)									
		1975*		1974		1973		1972		1971	
		L	D	L	D	L	D	L	D	L	D
No Treatment	156	5.9	0.11	6.0	0.16	7.6	0.22	5.7	0.32	5.6	0.44
70 sq ft BA	200	6.7	0.13	6.9	0.14	7.6	0.20	5.5	0.20	5.5	0.43
50 sq ft BA	104	7.9	0.14	6.7	0.23	8.2	0.35	5.7	0.48	5.1	0.59
30 sq ft BA	201	12.5	0.17	9.2	0.21	10.6	0.36	6.3	0.53	6.1	0.64
0 sq ft BA	106	13.7	0.20	8.4	0.32	9.3	0.47	6.3	0.61	5.7	0.74

*Leader

Table 3. Monthly Cumulative Rainfall (inches) at Black River Falls, WI, April-September, 1971 through 1975.

Month	Year				
	1971	1972	1973	1974	1975
April	0.85	1.92	6.11	2.54	4.00
May	4.96	4.81	13.60	5.64	6.38
June	7.21	6.48	17.27	10.62	11.90
July	15.84	11.69	18.78	11.95	12.98
Aug.	18.24	16.73	23.78	15.42	22.18
Sept.	23.57	25.83	25.64	17.12	24.13